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NPTEL

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Courses » Ordinary and Partial Differential Equations and Applications

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Unit 6 - Week 5

Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-09-12, 23:59 IST.**
As per our records you have not submitted this assignment.

1) *The critical points of the autonomous system* **1 point**

$\frac{dx}{dt} = x - 2y + 3, \quad \frac{dy}{dt} = x - y + 2$

are given by

- $(0,0), (2,3)$
- $(1,-1)$
- $(1,1)$
- $(-1,1)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(-1,1)$

2) *The nature of critical point* $(0,0)$ *for linear autonomous system* **1 point**

$\frac{dx}{dt} = 2x, \quad \frac{dy}{dt} = 3y,$

is a

- *Node*
- *Saddle point*
- *Spiral point*
- *Center*

No, the answer is incorrect.
Score: 0

Accepted Answers:
Node

3) *The nature of critical point* $(0,0)$ *for linear autonomous system* **1 point**

$\frac{dx}{dt} = -3x + 4y, \quad \frac{dy}{dt} = -2x + 3y,$

Google

Spiral point

Center

No, the answer is incorrect.
Score: 0

Accepted Answers:
Saddle point

4) *The nature of critical point* $(0,0)$ *for linear autonomous system* **1 point**

$\frac{dx}{dt} = -x - 2y, \ \frac{dy}{dt} = 4x - 5y,$
is a

Node

Saddle point

Spiral point

Center

No, the answer is incorrect.
Score: 0

Accepted Answers:
Spiral point

5) **1 point**

The nature and stability property of critical point $(0,0)$ *for linear autonomous system*
$\frac{dx}{dt} = 5x + 2y, \ \frac{dy}{dt} = -17x - 5y,$
is

an asymptotically stable center

a stable but not asymptotically stable center

unstable node

an asymptotically stable spiral

No, the answer is incorrect.
Score: 0

Accepted Answers:
a stable but not asymptotically stable center

6) **1 point**

The nature and stability property of critical point $(0,0)$ *for linear autonomous system*
$\frac{dx}{dt} = -4x - y, \ \frac{dy}{dt} = x - 2y,$
is

an asymptotically stable spiral

an asymptotically stable node

a stable but not asymptotically stable center

an unstable node

No, the answer is incorrect.
Score: 0

Accepted Answers:

an asymptotically stable node

7) **1 point**

The nature and stability property of critical point $(0,0)$ *for linear autonomous system*

$\frac{dx}{dt} = 4x - 2y, \ \frac{dy}{dt} = 5x + 2y,$

is

- *an unstable node*
- *an asymptotically stable spiral*
- *an asymptotically stable node*
- *an unstable spiral*

No, the answer is incorrect.
Score: 0

Accepted Answers:
an unstable spiral

8) **1 point**

The nature and stability property of the simple critical point $(0,0)$ *for non − linear autonomous s*

$\frac{dx}{dt} = x + y - 2xy, \ \frac{dy}{dt} = -2x + y + 3y^2,$

is

- *an asymptotically stable node*
- *an asymptotically stable spiral*
- *an unstable spiral*
- *an unstable node*

No, the answer is incorrect.
Score: 0

Accepted Answers:
an unstable spiral

9) **1 point**

The nature and stability property of the simple critical point $(0,0)$ *for non − linear autonomous s*

$\frac{dx}{dt} = -x - y - 3x^2y, \ \frac{dy}{dt} = -2x - 4y + y\sin\ x,$

is

- *a stable but not asymptotically stable node*
- *an asymptotically stable node*
- *an unstable saddle point*
- *an asymptotically stable spiral*

No, the answer is incorrect.
Score: 0

Accepted Answers:
an asymptotically stable node

10) **1 point**

The nature and stability property of critical point $(0,0)$ *for linear autonomous system*

$\frac{dx}{dt} = x + 4y - x^2, \ \frac{dy}{dt} = 6x - y + 2xy$

is

- *an unstable saddle point*
- *unstabe node*
- *asymptotically stable node*
- *asymptotically stable spiral point*

No, the answer is incorrect.
Score: 0

Accepted Answers:
an unstable saddle point

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